APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/803,168	03/09/2001	Kiyokuni Kawachiya	JP919990286US1	4740

7590 06/14/2004	EXAMINER
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ART UNIT	PAPER NUMBER
2126	

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Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/803,168	KAWACHIYA ET AL.
	Examiner	Art Unit
	Phuong N. Hoang	2126

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>29 March 2004</u>.
2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is

closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1 - 10</u> is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) <u>1 - 10</u> is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All   b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.
2.☐ Certified copies of the priority documents have been received in Application No. _____.
3.☐ Copies of the certified copies of the priority documents have been received in this National Stage

application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date <u>6/11/04</u>.

4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

DETAILED ACTION

1.   Claims 1 – 10 are pending for examination.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3.   Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipate by Holzle, US

patent no. 6,209,066.

4.   **As to claim 1**, Holzle teaches a computer system having a data processing

environment, in which a program is divided into and executed as multiple threads,

and in which the threads share and access data that is stored in a memory device,

comprising the steps of:

a)   means for indicating specific data that will be accessed only by a specific thread (thread 306a col. 7 line 65 – col. 8 line 5);

b)   means for determining, when a thread attempts to access data, whether a specific thread indication is present relative to the data being accessed (private blocks 304b,d,f, col. 8 lines 1 – 5);

c)   means for accessing the specific data without first performing a locking process to reject access attempts by other threads (threads with a private block may use a non-locking, fast-allocation routine, col. 9 lines 1 – 20), when the specific thread indication is present (when a thread is assigned a private block, col. 9 lines 1 – 20);

d)   means for performing a locking process for the data being accessed before accessing the data when it is determined that no specific (when a thread is assigned a shared block, col. 9 lines 1 – 20), thread indication is present (when a thread is assigned a shared block, col. 9 lines 1 – 20).

5.   **Claims 3, 4, 6, 7, and 9 are rejected under 35 U.S.C. 102(a) as being anticipate by Steele, US patent no. 5,862,376.**

6.   **As to claim 3,** Steele teaches the steps of:

a)   flag data, provided for an object for indicating an existence of a locality specifying that the object is to be accessed only by a specific thread (lock bit 226 is set to the "true" state (i.e., lock bit = 1), the object is currently synchronized with a particular thread that has exclusive use (or sole access) to the object, col. 5 lines 35 – 65);

b)   means for having the specific thread access the object when the flag data for the object indicates the locality for the specific thread, without performing a locking process to reject access attempts by other threads or other objects before accessing the specific data (each thread of execution can execute a number of methods where each method can require synchronization to a particular object. It is often the case that each of the methods of a particular thread are not award of the locks obtained by the other methods, col. 4 lines 24 – 30).

c)   means for having the specific thread perform the locking process before accessing the object (thread T-01 that has made a series of lock requests, col. 6 lines 15 – 20) when the flag data does not indicate the locality for the specific thread (lock bit = 0 indicates that the object is not synchronized with a particular thread, col. 5 lines 55 – 60).

7.   **As to claim 4,** Steele teaches the steps of when the object is created by a thread (each thread of execution can execute a number of methods where each method can require synchronization to a particular object, col. 4 lines 24 – 28), the object sets the flag data indicating a locality exists for the thread (lock bit = 1, col. 5 lines 50 – 60), and wherein, before the is changed so that it can be accessed by another thread, the locality indicated by the flag data is cancelled (lock bit = 0, col. 5 lines 50 – 60 and col. 6 lines 15 - 25).

8.   **As to claim 6,** see rejection for claim 3, and claim 4 for object sets the flag.

9.   **As to claim 7,** Steele teaches performing the locking process (lock requests, col.

6 lines 15 – 20), when the specific object has a locality for a specific thread (inherent),

that was skipped at the time the specific object was access by the specific thread (a

particular thread are not aware of the locks, col. 4 lines 25 – 30 and lines 65 – 67).

10.   **As to claim 9,** see rejection for claim 6. Further, Steele teaches four processes,

each performs each function (Steele's system is a multiprocessor computer system on

which threads running in parallel on the processors, col. 1 lines 12 – 25).

Claim Rejections - 35 USC § 103

11.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which the subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

12.   **Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over**

Holzle, US patent no. 6,209,066 in view of Adcock, US patent no. 5,652,883.

13.   **As to claim 2,** Holzle does not teach specific thread detects data and the

specific thread does not have a reference pointer to the data, and release memory to

provide free storage.

Adcock teaches thread detects data, and the specific thread does not have a

reference pointer to the data (objects 121, 125, 126, 127, and 128 are inaccessible

because there are no pointers to these objects, col. 3 lines 20 – 25 and col. 1 lines 60 -

65), and release memory to provide free storage (the garbage collector knows whether

a memory contains a pointer, does not contain a pointer,..... the inaccessible objects

121, 124 – 128 have been deallocated into free spaces, col. 3 lines 20 – 35).

It would have been obvious to one of ordinary skill in the art to combine the

teaching of Holzle and Adcock's system because Adcock's thread detecting data would

keep track of which object is not accessible and clean up to save the memory storage

when not being used.

14.   **Claims 5, 8, and 10 are rejected under 35 U.S.C. 103(a) as being**

unpatentable by Steele, US patent no. 5,862,376 and in view of Adcock, US patent

no. 5,652,883.

15.   **As to claim 5,** Steele teaches the specific thread detects an object for which the

flag data indicates the existence of a specific thread (lock bit = 1, col. 5 lines 50 – 60).

Steele does not teach if the thread does not have a reference pointer to the data,

therefore release the object to provide memory storage.

Adcock teaches the specific thread does not have a reference pointer to the data (objects 121, 125, 126, 127, and 128 are inaccessible because there are no pointers to these objects, col. 3 lines 20 – 25 and col. 1 lines 60 - 65), and release memory to provide free storage (the garbage collector knows whether a memory contains a pointer, does not contain a pointer,..... the inaccessible objects 121, 124 – 128 have been deallocated into free spaces, col. 3 lines 20 – 35).

It would have been obvious to apply the teaching of Adcock to Holzle's system because the system can keep track of which object is not accessible and clean up to save the memory storage when not being used.

16.   **As to claim 8,** see rejection for claim 3 for flag data, and claim 5.

17.   **As to claim 10,** see rejection for claim 8 above. Further, Steele teaches three processes, each performs a function (Steele's system is a multiprocessor computer system on which threads running in parallel on the processors, col. 1 lines 12 – 25).

Response to Arguments

18.   Applicant's arguments filed on 3/29/04 have been fully considered but they are not persuasive.

19.   Applicant argued in substance that

(1).   Holzle does not teach thread locality of dynamically changing data. The

flag may be dynamically turned off during the execution. The targeting objects

allocated from the allocation area, and not targeting the allocation area itself, as

to claim 1.

(2).   The Steel "lock bit 226" does not mean that the object is inaccessible, so it

is completely different from the thread-locality flag of the present invention, as to

claims 3 – 10.

(3).   Adcock does not teach a method for collecting memory area by just

checking one thread's stack, as to claim 2.

20.   Examiner respectfully disagrees with applicant's remark

As to point 1, applicant did not claim thread locality of dynamically changing data.

The flag may be dynamically turned off during the execution. The targeting

objects allocated from the allocation area, and not targeting the allocation area

itself.

As to point 2, one of ordinary skill in the art would know that the functionality of

lock is to block other threads from accessing an object that is being locked with a

particular thread (lock bit 226 is set to the "true" state (i.e., lock bit = 1), the object

is currently synchronized with a particular thread that has exclusive use (or sole access) to the object, col. 5 lines 35 – 65).

As to point 3, applicant does not explicitly claim a method for collecting memory area by just checking one thread's stack.

Conclusion

21.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

22.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuong N. Hoang whose telephone number is (703)

605-4239. The examiner can normally be reached on Monday - Friday 9:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (703)305-9678. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ph
June 11, 2004

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